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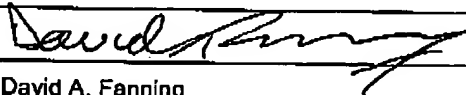
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TRANSMITTAL FORM <small>(to be used for all correspondence after initial filing)</small>	Application Number	09/929,426	
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	First Named Inventor	Stephen F. Gass	
	Art Unit	3724	
	Examiner Name	Jason D. Prone	
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ENCLOSURES (Check all that apply)		
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Date: July 5, 2005

STEPHEN F. GASS, ROBERT L. CHAMBERLAIN,
BENJAMIN B. SCHRAMM, JOEL F. JENSEN and
JONATHAN N. BETTS-LACROIX

Serial No.: 09/929,426

Examiner Jason D. Prone

Filed: August 13, 2001

Group Art Unit 3724

For: DETECTION SYSTEM FOR POWER EQUIPMENT

To: Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450REPLY BRIEF

The Examiner responded to the appeal brief with an Office action mailed June 14, 2005, in which he said he re-opened prosecution because of a new ground of rejection. The new ground of rejection was a provisional double patenting rejection under the judicially created doctrine of obviousness-type double patenting. The Examiner responded to the appeal brief with an Office action instead of an answer because he was following the procedure set forth in 37 CFR 1.193(a)(2), which said he could not raise a new ground of rejection in an answer. That regulation, however, was replaced on September 13, 2004 by 37 CFR 41.39. Under the new regulation the Examiner may raise a new ground of rejection in his answer to the appeal brief. If he does, then appellant either requests prosecution be reopened or requests the appeal be maintained. 37 CFR 41.39(b). In light of the new regulation, appellant treats the Office action mailed June 14, 2005 as the Examiner's answer to the appeal brief and requests that the appeal be maintained.

Page 1 - REPLY BRIEF
Serial No. 09/929,426

1. Real party in interest.

The real party in interest is SD3, LLC, the assignee of the above-identified application. SD3 is a privately owned Oregon limited liability company.

2. Related appeals and interferences.

There are no other appeals or interferences known to applicant which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

3. Status of claims.

The application was filed with claims 1-25. The appealed claims are claims 1-7. Claims 8-25 have been cancelled without prejudice.

4. Status of amendments.

All amendments have been entered.

5. Summary of claimed subject matter.

The following summary was set forth in the appeal brief and is repeated here.

The claims involved in this appeal describe a woodworking machine with a new safety system designed to detect contact between a person and a cutter and to trigger some predetermined action if contact is detected. The contact detection system is adapted to distinguish contact with a person from contact with other items so that the predetermined action is not triggered unnecessarily. One embodiment of the woodworking machine is a table saw that detects when a person accidentally contacts the spinning blade and then stops and/or retracts the blade to minimize any injury. The table saw distinguishes contact with a person from contact with green or wet wood so that the reaction system does not trigger when cutting the wood. Table saws embodying this technology are currently being sold under the name SawStop.

The machine of claim 1 includes a conductive cutter adapted to cut a workpiece (such as cutter 40 in Figure 2), and a motor adapted to drive the cutter. A contact detection system (such as detection subsystem 22 in Fig. 1) imparts an electrical signal to the cutter and the electrical signal has at least one property that changes when a person contacts the cutter. If a person contacts the cutter, then a reaction system (such as reaction system 24 in Fig. 1) causes a predetermined action to take place. (Embodiments of various contact detection systems are shown in Figures 5-17 and discussed on pages 11-31 of the submitted specification and in paragraphs 40-84 of the published application. An exemplary change in signal property that occurred when an actual finger contacted the blade of a table saw is shown in Fig. 7.)

Claim 1 specifies that the contact detection system is adapted to distinguish contact between a person and the cutter from at least one other event generating a comparable amount of change in the relevant property of the electrical signal based on the time during which the change in the property occurs. For example, green wood may cause the signal property to change because it is somewhat conductive, but the change occurs slower than if the blade contacts a person. Thus, in this example, the contact detection system would distinguish between cutting green wood and cutting a person by looking at the time during which the signal property changed. (This is discussed at various locations in the specification, including pages 23:15 to 26:15 and pages 29:10 to 30:19 of the submitted specification, and paragraphs 65-71 and 79-82 of the published application.)

Claims 2-7 all depend from claim 1, either directly or indirectly. Claim 2 further recites that the signal property is voltage amplitude. Claim 3 recites that the contact

detection system is adapted to identify contact between a person and the cutter as a reduction in the voltage amplitude of at least 5% within 100 microseconds. Claim 4 recites that the time during which the change in the signal property occurs is less than one millisecond, and claim 5 recites that the change occurs in less than 100 microseconds. Claim 6 recites that the event which generates a comparable amount of change in the signal property is contact between the cutter and green wood. Claim 7 recites that the predetermined action includes stopping the movement of the cutter.

6. Grounds of rejection to be reviewed on appeal.

The grounds of rejection presented for review are:

1. The provisional rejection of claims 1, 4, 6 and 7 under the judicially created doctrine of obviousness-type double patenting in light of claims 1, 6 and 9 of co-pending application 10/643,296.
2. The rejection of claims 1, 2, 4, 5 and 7 under 35 USC 102(b) as anticipated by U.S. Patent No. 5,942,975 to Sorensen.
3. The rejection of claim 3 under 35 USC 103(a) as obvious in light of Sorensen.
4. The rejection of claim 6 under 35 USC 103(a) as obvious in light of Sorensen combined with U.S. Patent No. 6,366,099 to Reddi.

7. Argument.**Obviousness-Type Double Patenting**

Claims 1, 4, 6 and 7 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting in light of claims 1, 6 and 9 from co-pending application number 10/643,296. Applicant points out that co-pending claim 1 has been amended and co-pending claims 6 and 9 have been cancelled without prejudice. As a result, appellant believes this rejection is moot. Nevertheless, if the Examiner maintains this rejection, then the Board should reverse because claims 1, 4, 6 and 7 in the present application are patentably distinct and not obvious in light of co-pending claim 1.

Claim 1 from the present application recites:

A woodworking machine comprising:
a conductive cutter adapted to cut a workpiece;
a motor adapted to drive the cutter;
a contact detection system electrically coupled to the cutter to impart an electrical signal thereto, where the electrical signal has at least one property, and where the at least one property is changed when a person contacts the cutter, and where the contact detection system is adapted to distinguish contact between the cutter and the person from at least one other event generating a comparable amount of change in the at least one property based on the time during which the change in the at least one property occurs; and
a reaction system adapted to cause a predetermined action to take place upon detection of contact between the person and the cutter by the contact detection system.

Claim 1 from the co-pending application, as amended, recites:

A miter saw comprising:
a base adapted to support a workpiece during cutting;
a fence on the base;
a motor;
a rotatable blade driven by the motor;
a pivot arm assembly associated with the base and supporting the blade, where the pivot arm assembly is adapted to pivot toward

and away from the base to move the blade toward and away from the base; and

a safety system having a detection subsystem adapted to detect the occurrence of an unsafe condition between a person and the blade, and a reaction subsystem adapted to mitigate the unsafe condition, where the reaction subsystem includes a brake mechanism positioned adjacent the blade and adapted to engage the blade and further adapted to maintain its position adjacent the blade when the blade moves toward or away from the base.

Claim 1 from the present application is patentably distinct from the cited co-pending claim because the co-pending claim fails to teach or suggest a number of limitations recited in claim 1 in the present application. For example, claim 1 in the present application recites a contact detection system while the co-pending claim teaches a subsystem to detect the occurrence of an unsafe condition – the co-pending claim does not specify that the unsafe condition is contact. Claim 1 in the present application also recites at least the following limitations that are not taught or suggested by the co-pending claim: an electrical signal having at least one property that is changed when a person contacts the cutter, and the contact detection system being adapted to distinguish contact with a person from other events based on the time during which the change in the property occurs. Claim 1 is patentable distinct and not obvious in light of the co-pending claim because the co-pending claim fails to teach or suggest these limitations. See MPEP 2143.03 (all claim limitations must be taught or suggested in the prior art).

Claim 4 in the present application depends from claim 1 and further specifies that “the time during which the change in the at least one property occurs is less than one millisecond.” Claim 6 in the present application also depends from claim 1 and specifies that “the at least one other event is contact between the cutter and green wood.”

Claim 7 from the present application depends from claim 1 and specifies that "the predetermined action includes stopping movement of the cutter." The cited co-pending claim does not teach or suggest any of these limitations, and therefore, claims 4, 6 and 7 in the present application are patentably distinct and not obvious in light of the cited co-pending claim. See MPEP 2143.03.

For these reasons, appellant requests the board to reverse this provisional rejection if it is maintained.

Anticipation Under 35 USC 102(b)

Claims 1, 2, 4, 5 and 7 stand rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 5,942,975 to Sorensen. The Board should reverse that rejection because Sorensen fails to disclose a contact detection system "adapted to distinguish contact between the cutter and the person from at least one other event generating a comparable amount of change in the at least one property based on the time during which the change in the at least one property occurs," as required by appellant's claims. The system in Sorensen looks for a change in amplitude of a signal; it does not and cannot look for the rate of change of that amplitude. This was explained in appellant's Appeal Brief.

The Examiner, however, says Sorensen is able to distinguish events based on the time during which the signal changes, and he explains his position as follows:

So if a person is one inch away and moves one half an inch towards the cutter [in Sorensen], the signal will change by some amount, and when the person moves another half an inch towards the cutter, thereby contacting the blade, the event will generate a comparable amount of change, but will be distinguished from the first event in that the voltage amplitude will have reached a predetermined value signaling contact. The property that is changing is the alternating voltage, which has a frequency defined as the change in the value of the voltage amplitude

per unit time. Therefore, Sorensen discloses a contact detection system that distinguishes between events generating a comparable amount of change in a property that is based on time during which a change in the property occurs. (Office action, 6.)

The Examiner's argument misses the point. If a person moved one-half inch toward the cutter in Sorensen, and then moved another one-half inch toward the cutter, the signal might change similarly with each move, but nothing in Sorensen would detect the time it took the signal to change and nothing in Sorensen could distinguish those events based on the time during which the change occurred. It may be that the first move took one second while the second move took ten seconds, but there simply is no way for the device disclosed in Sorensen to detect those different rates of change.

Without the ability to detect the rate of change of the signal, there is no way for Sorensen's system to distinguish contact with a person from some other event that generates a comparable change in the signal based on the time during which the change occurs, as required by appellant's claims. For example, Sorensen's system could not distinguish contact with a person from contact with green wood because both contacts would cause the signal to change a comparable amount even though it may take longer for the signal to change in one case than in the other. In that example, the electrical signal may initially be at 3 volts and then drop to 2 volts over 30 microseconds when the tooth of a cutter contacts a person, but it might take around 10,000 microseconds for the signal to drop to 2 volts when green wood contacts the blade. Each contact causes the signal to drop to 2 volts, so the system disclosed in Sorensen would trigger protective action in both cases. In appellant's claims, however, the system differentiates the two different contacts based on the time during which the change

occurs, and as a result, a protective action would be triggered if the person contacted the blade but not if green wood contacted the blade.

The Examiner seems to think that Sorensen detects the rate of change because the signal carrying the voltage amplitude has a given frequency. The Examiner says: "The preferred frequency is disclosed as 10Hz-200kHz (column 5, lines 63-64), which means that the amplitude can be checked between 20 times per second to 400,000 times per second (amplitude can be checked twice per wavelength)." (Office action, 6-7.) But checking the amplitude multiple times per second is not the same as checking how fast the amplitude changes – the signal may change relatively quickly or slowly between checks or from one check to the next. Something more is required to measure the rate of change, such as a gain control system or differentiator, and Sorensen fails to disclose or even suggest any such system.

The Examiner also says frequency is defined as "the change in the value of the voltage amplitude per unit time." (Office action, 6.) As explained in the Appeal Brief, that definition of frequency is incorrect. Frequency is "the number of cycles per second of an alternating electric current." (Webster's New Twentieth Century Dictionary of the English Language Unabridged, 732, Prentice Hall Press, 2 ed. (1983). It is not "the change in the value of the voltage amplitude per unit time" – that is the differential of the voltage amplitude. This misunderstanding of frequency is perhaps the reason why the Examiner asserts that Sorensen is capable of detecting the rate of change of a signal.

In summary, Sorenson simply detects whether the amplitude of an alternating signal exceeds a predetermined threshold. It does not disclose or suggest any system or mechanism to measure the rate of change of that amplitude and it does not identify a

reason to do so. Therefore, Sorenson cannot anticipate the claims on appeal, and applicant asks the Board to reverse this rejection.

It is also important to understand that Sorensen's system is fundamentally different than the system disclosed in appellant's claims because Sorensen's system transmits a signal from one object to another and then checks to see if the signal was received with sufficient intensity. It does not impart a signal to a cutter or monitor the signal for changes. (Column 2, lines 40-48; column 5, lines 37-46; and Fig. 4.) For example, Sorensen says a chain saw can transmit a signal through the handle of the saw to a person holding the saw, and the person can then transmit the signal to the blade. The intensity of the signal received by the blade will depend on the distance between the person and the blade. If the system receives the signal with a given intensity, then a person is too close to the blade and a protective operation (such as interrupting power to the motor) will be activated. (Column 8, lines 40-65.) It is by contacting the handle or other structure that the signal is applied to the person so that it can be transmitted to the receiver.

The system disclosed in appellant's claims, in contrast, includes a contact detection system to impart an electrical signal to a cutter and to monitor the signal for changes. By imparting a signal to a cutter and then monitoring the signal for changes, appellant's device can distinguish contact between a person and the cutter from contact with other objects. In order for Sorensen's system to detect contact with some other object and distinguish that contact from contact with a person, a signal would have to be applied to the object so that it could be transmitted to the receiver and that signal would somehow have to be different than the signal transmitted through the person. But there

is no teaching or suggestion in Sorensen how to apply the signal to the object or that the signal would have to be different. That is because Sorensen's system is designed to detect the distance between two objects, not to distinguish contact with a person from contact with other items. This is a fundamental difference in the principle of operation of Sorensen.

Obviousness Under 35 USC 103(a)

Claim 3 stands rejected under 35 U.S.C. 103(a) as obvious in light of Sorensen, and claim 6 stands rejected as obvious in light of Sorensen combined with U.S. Patent No. 6,366,099 to Reddi. The Board should reverse those rejections for the reasons explained in appellant's Appeal Brief. Appellant also points out that claim 3 recites a system that looks for a defined "reduction in the voltage amplitude." Sorensen, in contrast, detects an increase in signal amplitude, not a reduction, and certainly not the rate of reduction set forth in the claim. Claim 6 depends from claim 1 and specifies that the other event "is contact between the cutter and green wood." The system in Sorensen is not configured to detect contact between green wood and the cutter, as explained.

8. Appendix.**Claim 1:**

A woodworking machine comprising:

a conductive cutter adapted to cut a workpiece;

a motor adapted to drive the cutter;

a contact detection system electrically coupled to the cutter to impart an electrical signal thereto, where the electrical signal has at least one property, and where the at least one property is changed when a person contacts the cutter, and where the contact detection system is adapted to distinguish contact between the cutter and the person from at least one other event generating a comparable amount of change in the at least one property based on the time during which the change in the at least one property occurs; and

a reaction system adapted to cause a predetermined action to take place upon detection of contact between the person and the cutter by the contact detection system.

Claim 2:

The machine of claim 1, where the at least one property is the voltage amplitude of the electrical signal.

Claim 3:

The machine of claim 2, where the contact detection system is adapted to identify contact between a person and the cutter as a reduction in the voltage amplitude of the signal on the cutter of at least 5% within 100 microseconds.

Claim 4:

The machine of claim 1, where the time during which the change in the at least one property occurs is less than one millisecond.

Claim 5:

The machine of claim 1, where the time during which the change in the at least one property occurs is less than one hundred microseconds.

Claim 6:

The machine of claim 1, where the at least one other event is contact between the cutter and green wood.

Claim 7:

The machine of claim 1, where the predetermined action includes stopping movement of the cutter.

9. Evidence appendix.

None.

10. Related proceedings appendix.

None.

Respectfully submitted,

SD3, LLC



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Date: July 5, 2005


David A. Fanning